99B114

Proposal Title: Delta Meadows Natural Communities Inventory and Habitat Restoration
Applicant Name: California Department of Parks and Recreation/Delta State Parks
Mailing Address: 17645 Highway 160, Rio Vista, California 94571
Telephone: (916) 777-7701
Fax: (916) 777-7703
Email: deltaparks@citlink.net

Amount of funding requested: $ 696,000 for 3 years

Indicate the Topic for which you are applying (check only one box).

Fish Passage/Fish Screens	Introduced Species
⇒Habitat Restoration	Fish Management/Hatchery
Local Watershed Stewardship	Environmental Education
Water Quality	

Does the proposal address a specified Focused Action? X yes _____ no

What county or counties is the project located in? Sacramento

Indicate the geographic area of your proposal (check only one box):

Sacramento River Mainstem	East Side Trib
Sacramento Trib:	Suisun Marsh and Bay
San Joaquin River Mainstem	North Bay/South Bay:
San Joaquin Trib:	Landscape (entire Bay-Delta watershed)
⇒Delta:	Other:

Indicate the primary species which the proposal addresses (check all that apply):

San Joaquin and East-side Delta tributaries fall-run chinook salmon	Winter-run chinook salmon
Spring-run chinook salmon	Late-fall run chinook salmon
Fall-run chinook salmon	⇒Delta smelt
⇒Longfin smelt	⇒Splittail
⇒Steelhead trout	Green sturgeon
Striped bass	⇒Migratory birds
⇒All chinook species	Other:
⇒All anadromous salmonids	

Specify the ERP strategic objective and target (s) that the project addresses. Include page numbers from January 1999 version of ERP Volume I and II:

Improving quality of Delta sloughs
(ERP Vol.1, p. 30)
Increasing riparian habitat
(ERP Vol. 1, pp.1, 31)
Monitoring
(ERP Vol.1, pp.6-11, 31-33)

Indicate the type of applicant (check only one box):

⇒State agency	Federal agency
Public/Non-profit joint venture	Non-profit
Local government/district	Private party
University	Other:

Indicate the type of project (check only one box):

Planning	⇒Implementation
Monitoring	Education
Research	

By signing below, the applicant declares the following:

1.) The truthfulness of all representations in their proposal;

2.) The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and

3.) The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Marilyn Murphy for Stuart Macy
Printed name of applicant

Marilyn Murphy 4-15-99
Signature of applicant

Delta Meadows Natural Communities Inventory and Habitat Restoration

The Resources Agency
California Department of Parks and Recreation
Brannan Island State Recreation Area
Stuart Macy, Superintendent
(916) 777-7702
(916) 777-7703 (fax)
deltaparks@citlink.net

Type of Organization: State Agency

Executive Summary

Delta Meadows State Park, a unit of the California State Park system, is located along the Delta's eastern corridor in the backyard of Walnut Grove and Locke, California. Consisting of approximately 600 acres of wetland slough, tidal freshwater marsh, and riparian habitat, the area represents some of the only remnant habitat of its kind anywhere in the Delta. A large portion of the project area never has been altered by construction of levees or by agricultural activity. This site has unique value for restoration potential, comparative scientific interest, and educational/recreational benefits. The purpose of this proposal is two-fold: 1) to develop a baseline inventory of the existing habitat conditions; 2) to restore approximately 30 acres of the area that is currently covered by weeds and pasture

A detailed inventory program of existing high quality habitat conditions is proposed for the unique ecosystem of Delta Meadows. The scientific information from this monitoring will be used as the basis for restoration design throughout the Delta. Components of the scientific inventory include the following elements: aerial photography, GIS mapping, and vegetation analysis for species and structural diversity; aquatic invertebrates/insect surveys; studies of fish, especially native species utilizing the extensive native habitat; and bird and mammal studies.

Location and Geographic Boundaries of the Project

Delta Meadows is located in the southeastern corner of the Courtland and the southwestern corner of the Bruceville 7.5 minute topographic quadrangle at 121 degrees 30 minutes east and 35-36 degrees north. Delta Meadows comprises 617 acres enclosed by Twin Cities Road to the north, the Delta Cross Channel on the south, the east levee of Snodgrass Slough on the east, and the west levee of Locke Slough and Meadows Slough on the west.

Ecological/Biological Objectives

Delta Meadows has some of the most outstanding habitat anywhere in the Delta. Opportunities exist to expand these habitat types, and to use baseline information from the inventory as the basis for restoring other areas of the Delta. The primary biological objectives are: 1) to restore portions of Delta Meadows to a natural, self-sustaining condition and to learn how these environments contribute to terrestrial wildlife diversity through monitoring studies of the restored patches in comparison to mature vegetation already existing at the site; and 2) to study existing wetland slough habitats in relationship to Delta fisheries issues, such as Delta smelt, splittail, chinook salmon, steelhead trout, and longfin smelt.

Cost

The total cost of the project is $696,000.00. This is broken down into two phases. The first phase is for baseline inventory of existing habitat totaling $336,000.00. The second phase is for the restoration of approximately 30 acres totaling $360,000.

Adverse Third Party Impacts

There are no known adverse impacts to third parties.

Applicant Qualifications

State Parks and its consultants are well qualified to deliver this project. The Habitat Assessment & Restoration Team (H.A.R.T.) and other subcontractors have had considerable experience in resource surveys, habitat restoration, and monitoring.

Local Support/Coordination with Other Programs and Compatibility with CALFED Objectives

This proposal is submitted with the request of the approval from the County Board of Supervisors and the Delta Protection Commission. Currently California State Parks provides canoe tours of Delta Meadows which is well attended by the local residence as well as visitors who camp and/or spend the day at Brannon Island State Recreational Area. Local area school groups attend interpretative programs at Brannon Island State Recreational Area. These programs will be expanded into Delta Meadows.

The project addresses the CALFED primary objective of improving the restoration component of ecosystem function. The project addresses the following objectives: 1) the protection and restoration of functional habitat types for public values such as recreation, scientific research, and aesthetics; 2) the inventory and recovery of at-risk native species; 3) the rehabilitation of natural processes in the Bay-Delta; 4) prevention of the establishment and reduction of the negative impact of established non-native species

Project Description

The gradual transition from open water to tule, riparian habitat, and oak woodland is representative of pre-settlement conditions in the Delta, once vast and richly productive but now generally lined with rock revetment shorelines. Delta Meadows continues to be productive and valuable for many species of wildlife such as fish, small mammals, neotropical migrant birds, waterfowl, and raptors. Delta Meadows is strategically located at the intersection between the eastern Delta, the Cosumnes River watershed, and the Stone Lakes National Wildlife Refuge. This site has unique value for restoration potential, comparative scientific interest, and educational and recreational benefits. The purpose of this proposal is two-fold: 1) to develop a baseline inventory of the existing habitat conditions; 2) to restore approximately 30 acres of the area that is currently covered by weeds and pasture

Proposed Scope of Work

Base Line Data Inventory and Mapping - Phase I

A detailed inventory program of existing high quality habitat conditions is proposed for the unique ecosystem of the Delta Meadows. The scientific information from this monitoring will be used as the basis for restoration design throughout the Delta. A species inventory list will be compiled for Delta Meadows. Currently there is no species list. The lists will help State Parks develop a Management Plan for Delta Meadows and provide educational material for the public. Permanent monitoring plots and transects along with methodology will be established for long term monitoring in the State Park. Components of the scientific inventory include the following elements:

Vegetation Surveys. The distribution patterns of particular species of plants in riparian communities are delineated by a combination of individual species adaptations along elevation gradients and by particular histories of founder populations. The result of this interplay between environment and history is a patchwork of different vegetation communities, consisting of tules, wetland shrub, willow, cottonwood, sycamore, and oak patch types found in close proximity to one another. This diversity will be documented through aerial photography and, on the ground, by phytosociological sampling. Fine-scaled aerial photography will be used to record vegetation cover types. In order to capture plant species reflectance values at various times of the year, three separate color airphotos will be taken: winter, mid spring, and summer. These will be ground truthed to enhance the accuracy of vegetation classification. The airphotos will be rectified using current GPS technology, and will be incorporated into the ArcView GIS system. Vegetation types will be digitized and classified in the GIS format as shape files. Line transects will be laid out at various locations in the Park to record plant community structure (physiognomy), species composition, stem density, cover, and regeneration using standard phytosociological inventory methods.

Birds. The surveys will determine the baseline conditions of five components of the avian community: 1) avian diversity (complete species list), 2) seasonal status of each species, 3) densities of breeding species (resident and neotropic component), 4) habitat

associations (all species), and 5) vertical canopy distribution in forest habitats. Sampling methods will be transect oriented and will use pre-established routes. Variable circular plots conducted from established transects will be used to sample birds during the breeding season at the center of each sample plot. The plots will be sampled from 0.5 - 3.0 hours after sunrise with a settling period of 2 minutes followed by a survey period of 8 minutes. Species and distance from the plot center will be recorded. When in forest tracts, elevation in canopy will be noted for each observed bird during the count period. Variable line transect statistics adjusted for circular plot areas will be calculated from program DISTANCE to estimate breeding densities of common species. If numbers of certain species are inadequate to produce density estimates, an index of average number of birds per plot will be reported. Playback recordings will be tested on a sub-sample of plots to augment surveys and improve counts of secretive species.

Mammals. Small mammal work will be conducted from grids in 1,000 meter-square blocks. A rectangular capture grid with Sherman live traps will be placed at or near the center of each plot center. Traps will be baited each evening within 3 hours of sunset and checked during 3 consecutive mornings within 3 hours of sunrise, once each during summer and winter seasons. Mark-recapture analyses will be used to estimate small mammal densities, or an index of catch per trap night will be reported. Traps will be provided with extra food and cotton insulation, and individuals that are injured inadvertently during trapping will be euthanized with humane methods of carbon dioxide asphyxiation or cervical dislocation

Aquatic Invertebrates/Insects. A single core sample (10cm diameter, 10cm depth) will be taken to enumerate benthic invertebrates at sampling transects at along Snodgrass and Meadows Slough. Samples will be screened (0.5 mm) and frozen prior to sorting. The invertebrates will be identified by order or family, counted, dried, and weighed to the nearest 0.1 mg. A sample will be conducted at the center of each 500m2-grid plot. A 0.5 m2 quadrate is placed at the center of the plot and three passes through the quadrate, each successively deeper, are made with the collection device. Collected insects are placed in alcohol and frozen prior to sorting. The insects will be identified by family or order, counted, dried, and weighed to the nearest 0.1 mg. Base line information on hydrology, such as tidal datum to examine changes in tidal levels, will be examined. Water quality information, such total hardness, temperature, pH, turbidity, salinity, and dissolved oxygen will be determined on site from integrated water column samples taken at each plot in the slough channels. These samples will be taken at high tide in conjunction with other seasonal monitoring on each plot monthly."

Fish. Fish species assemblages will be surveyed seasonally from sample sites or transects. Multiple gear types will be used to assess the distribution and relative abundance of juvenile and adult. As a minimum, throw nets and experimental (variable mesh) gill nets will be fished at all sites. At sites that can be waded, fish will also be sampled with bag seines. Snorkeling surveys may be employed in quiet backwater habitats. Fishing effort for each gear type will be standardized and replicated to allow for statistical comparisons of fish catch among dates and sites. At each site, captured fish will be identified by species and counted, then the first 25 individuals of each species will be measured for total length and weight. In addition, as many as 25 individuals from selected species will be fixed in 10% formalin for subsequent analysis of gut contents to determine their use of invertebrates. If fishes or fish-forage organisms cannot be identified reliably by project personnel, voucher

specimens will be submitted to taxonomic specialists for positive identification. Water quality information, such total hardness, temperature, pH, turbidity, salinity, and dissolved oxygen will be determined on site from integrated water column samples taken at each plot in the slough channels. These samples will be taken at high tide in conjunction with other seasonal monitoring on each plot monthly."

Restoration. – Phase II

Two areas within the property of Delta Meadows are proposed for restoration. The first area, (Area, Figure 1) consists of approximately half of a 40-acre lowland area surrounded by dikes (Figure1). Most of the site is covered with weeds, although scattered volunteer recruitment of native riparian trees and shrubs portends excellent restoration opportunities. The second proposed restoration area (Area B, Figure 1) consists of 10-15 acres of land that is part of a larger 300-acre parcel in the process of being purchased by the Department of Parks and Recreation. Because this site has been subject to grazing, the vegetation is sparse and consists of a mixture of weeds and native sedges. Both restoration sites have a high water table, suggesting likely success of riparian plant establishment. The two sites would differ somewhat in their restoration methods and installation requirements. Area A is a low elevation section of the Park, surrounded by levees, which can be restored to high quality riparian habitat with little effort. Proposed methods include disking in the late summer and fall to reduce weed competition and planting with container-grown plants and/or cuttings of riparian species during the late fall. Following installation, the plants will be watered and provided with weed protection. It is anticipated that, because of the high water table, no further watering will be required during the following season and thereafter. Two years of maintenance and monitoring will occur after the first year of installation. In Area B, invasive weeds (especially Himalaya blackberry) are being kept in check by ongoing grazing. The proposed restoration strategy for this site will be to establish sufficiently dense plantings and simultaneous exotics eradication efforts to control invasive and highly competitive weeds. For both sites, it is expected that approximately 350 woody plants per acre will be planted, consisting of valley oaks, cottonwood, willows, ash, box elders, wild rose, blackberry, dogwood, native sedges, and other plants will be planted.

Location and Geographic Boundaries of the Project

Delta Meadows is located in the southeastern corner of the Courtland and the southwestern corner of the Bruceville 7.5 minute topographic quadrangle at 121 degrees 30 minutes east and 35-36 degrees north. Delta Meadows comprises 617 acres enclosed by Twin Cities Road to the north, the Delta Cross Channel on the south, the east levee of Snodgrass Slough on the east, and the west levee of Locke Slough and Meadows Slough on the west.

Ecological/Biological Benefits

Ecological/Biological Objectives

The native ecosystem of Delta Meadows is unique. Opportunities exist to expand its habitat types, and to use baseline information from the inventory efforts as the basis for restoration in other areas of the Delta. The primary biological objectives are 1) to restore portions of Delta Meadows to their former diversity and to learn how these environments contribute to terrestrial wildlife distribution through monitoring studies of the restored patches in comparison to mature vegetation already existing at the site; 2) to study existing wetland slough habitats in relationship to Delta fish species such as Delta smelt, splittail, chinook salmon, steelhead trout, and longfin smelt.

Restoration design usually follows from concepts of alpha diversity: packing in as many species throughout a restoration area as will thrive under the limitations of the physical environment. In this proposal, the restoration design will be based on natural regeneration patterns as observed at Delta Meadows and other riparian systems. The distribution patterns of particular species of plants in riparian communities are sorted by a combination of individual species' adaptations along elevation gradients and by particular histories of founder populations. The composition of particular riparian stands generally are influenced by a combination of the individual species' germination and establishment requirements, competitive interactions with other species, and the plants' physiological tolerance for alternating conditions of flooding and drought. While the physical environment influences which species will occupy a site, the particular species that establishes itself on the site first (the "founder effect") and methods of regeneration also play significant roles in the evolution of riparian systems. Some species that regenerate through seed release and germination can dominate a site when the appropriate environmental conditions are met. Others spread through clonal vegetative growth. The result of these natural patterns of regeneration is a tendency for riparian systems to be dominated by patches of similar vegetation. Each patch type may be dominated by just a few species, but the collective contribution of many patch types will result in a richer assortment of species.

Several factors in designing patch types will be considered: diversity, rarity, habitat value to wildlife, effect on species that have been displaced disproportionately due to human land use practices, and overall landscape patterns. Botanical studies at Delta Meadows will be used as the basis for the restoration design. Preliminary observations indicate the existence of the following vegetation types: yellow willow, red-osier dogwood, valley oak, sycamore, wild rose, creeping wildrye, arroyo willow, sandbar willow, and sedge. Wildlife use of these different patches and vegetation associations also will be investigated.

The size of individual patches will also be investigated, especially from the standpoint of wildlife use. The desired size of patches has been a much-discussed issue in restoration planning. Ecological research regarding gap dynamics has highlighted the importance of single large trees that, when toppled, create new environmental conditions resulting in a new

patch type. A minimum patch size would therefore consider the effects of a single large tree fall. In California riparian systems, a reasonable tree patch size would be approximately 50-70 feet, which would reflect canopy spread of a large valley oak or cottonwood. Wildlife species appear to have become adapted to this inherently low within-patch diversity but greater between-patch diversity common to riparian systems. Recent research by the Point Reyes Bird Observatory (PRBO) indicates numerous beneficial effects of patchy and varied age structure to nesting success, rearing, and overall productivity of riparian bird species. Certain patch types may provide inherently better habitat, or habitat inadequately represented, compared to other types. For example, cottonwood and riparian forests characterized by a diversity of shrub and herbaceous components support a rich diversity of wildlife dependent species. Multi-layered vegetation riparian vegetation, as exemplified in several of the mixed species patch types, is well known to provide rich habitat for breeding and foraging avian communities. Likewise, other shrubby patch types, with different plant species and physiognomic architecture, provide other habitat values.

The arrangement of clumps into larger groupings, or patch aggregates, has larger implications. The patterning of different patches with respect to one another affects wildlife conditions. Research by PRBO indicates that adult nesting birds prefer certain habitats, whereas fledglings utilize other types. Therefore the juxtapositioning of fledgling "low rent" habitat with higher quality adult nesting habitat is recommended. Another finding of PRBO is the value of tall canopy trees surrounded by shrubby species.

Linkages

There are no known projects that are currently being funded at Delta Meadows. The Ecosystem Restoration Plan (ERP) includes goals, visions, and actions that support this project. These include improving the quality of Delta Sloughs (ERP, Vol. 1, page 30), increasing riparian habitat (ERP, Vol. I, page 1, 31), and monitoring (ERP, Vol. I , pages 6-11, 31-33).

System-Wide Ecosystem Benefits

The implementation of this project will be consistent with several existing programs. This unique site is located at the intersection of the eastern Delta, the Cosumnes / Mokelumne Rivers, and Stone Lakes National Wildlife Refuge where a consortium of private, state and federal programs are working together to restore ecosystem function. Evaluating possibly one of the best natural analogs of remaining Delta vegetation, the inventory studies will provide Delta-wide information regarding community structure, wildlife habitat relationships, and fisheries use of this important wetland slough environment.

Compatibility with Non-Ecosystem Objectives

Delta Meadows offers unique opportunities for recreational use and interpretation of the natural ecosystem values to the public. The Department of Parks and Recreation already operates a concession in which members of the public are taken on guided canoe tours of Delta Meadows. The Department envisions the potential for bird and nature walks. This will attract peripheral business to the merchants and restaurateurs of the Walnut Grove/Locke area.

The information gained from the inventory of resources would greatly aid State Park's interpretive program. Public participation in restoration efforts also would aid in increasing awareness of the need to improve ecosystem value in Delta. Phase III will develop interpretative materials and structures including interpretative signs, educational brochures, trails, and viewing platforms. State Parks plans on expanding their current interpretative programs involving the local community, schools and special interest groups.

Technical Feasibility and Timing

Project alternatives include the no-project alternative whereby Delta Meadows would provide a high value relict stand of pre-settlement delta vegetation and wildlife associations. No inventory, documentation, or mapping of the habitats would be available to provide a model for future delta habitat restoration design.

Regulatory compliance anticipated for this project includes preparing an Initial Study under the California Environmental Quality Act (Initial Study/Negative Declaration). Because the restoration will entail work in waters of the United States, a federal Clean Water Act Section 404 permit and Rivers and Harbors Act Section 10 permit will be obtained from the U.S. Army Corps of Engineers. It is believed that the project meets the conditions for authorization under nationwide permit number 27 (habitat restoration). Compliance with the National Environmental Policy Act would be obtained as part of the nationwide permit authorization.

Other permits and authorizations that will be obtained are listed Appendix 1. Under this task, all necessary environmental compliance documentation will be completed and permits secured.

Monitoring and Data Collection Methodology

Monitoring will involve two components. First under Phase I, a long term monitoring plan will be implemented at the completion of Phase I. Funding for this monitoring program is being requested through California State Parks and Recreation Resource Management Category H Funds. Monitoring will occur on either a 2, 3 or 5 year cycle depending on the information received from the inventory surveys.

Second under Phase II, monitoring of the restoration project will involve the implementation of standard short term, performance standards. It is anticipated that 350 woody plants and several thousand herbaceous plants will be planted per acre, with the objective of maintaining an 80% survival at the end of 3 years. Determination of plant survival by species and growth of installed planting compared to naturally growing individuals will be recorded in order to ascertain plant establishment and long term trends. Phase III will continue to monitor the restoration work and expand it. This section of Phase III will be funded through the Resource Management Category H Department funding program.

See Table IV for Monitoring and Data Collection Information.

Local Involvement

California Department of Parks and Recreation will work cooperatively with the restoration consultant to provide opportunities for the public to assist in the restoration efforts. Especially targeted will be the Walnut Grove, Courtland, Locke, Isleton communities, including school groups.

Cost

Table 1 enumerates the budget for this project. State Parks will administer and hire a project leader that will work with the project manager and his consultants for $50,000. The main focus of the project will be delivered by the Habitat Assessment & Restoration Team and its subconsultants. It is estimated that $70,000 is needed for planning and permitting. The detailed resource analysis will require $166,000. The main budget item is for restoration of 30 acres of land to prime riparian habitat, based on a price of $360,000. This includes the development of the restoration plan; collection, propagation and nursery growing of the plants; site preparation, including weeding; installation; irrigation and maintenance for the duration of the contract; monitoring of the planting efforts, and all aspects of project management. See Table II for Quarterly Budget.

Cost Sharing

California Department of Parks and Recreation

Purchase price of property = $590,000
Resource Inventory = 5,000
(literature search and preliminary species enumeration to be completed by 6/30/99)

California Department of Parks and Recreation/California Department of Boating and Waterways

Pumpout Station $50,000 (budget request for fiscal 1999-2000)

Applicant Qualifications

California State Parks and Recreation is a State Agency under the Department of Resources. The mission of the Department is to "provide for the health, inspiration and education of the people of California by helping preserve the State's extraordinary biological diversity, protecting it's most valued natural and cultural resources, and creating opportunities of high-quality outdoor recreation". Stuart Macy, Superintendent of the Delta Sector, has been with the Department for over 20 years. Marilyn Murphy, Resource Ecologist for the Gold Rush District has been with the Department for 8 years. Currently the Sector provides interpretative canoe trips into Delta Meadows and plans to expand the interpretative activities at Delta Meadows.

The principal consultant will be Habitat Assessment & Restoration Team, Inc. (H.A.R.T., Inc.), located near Walnut Grove, CA. H.A.R.T. specializes in natural resource surveys and habitat analyses, restoration design, nursery growing of native wetland plants, and restoration implementation. Located on Grand Island in the Delta, H.A.R.T.'s 10-acre facility includes a plant nursery, office, potting barn, storage and tool sheds, several vehicles, and considerable room for growth. Jeffrey A. Hart, Ph.D., will serve as overall project manager. Dr. Hart has had considerable success in designing and implementing restoration projects (Stone Lakes National Wildlife Refuge), bioengineering projects (e.g., Dry Creek, Lower American River, and North Fork of the Mokelumne River), and resource studies (e.g., Cosumnes River, Lower American River). His clients include mostly government agencies and non-profit companies such as the Sacramento Area Flood Control Agency, California Department of Water Resources, Turlock Irrigation District, Sacramento County Water Resources Division, Ducks Unlimited, and The Nature Conservancy. Hart has successfully completed restoration contracts with Ducks Unlimited (contact Jim Well, phone 852-2000). Since moving to Grand Island in July 1998, H.A.R.T. has successfully established a native plant nursery where considerable quantities of native plants are already under propagation. Jeff Hart and employees will perform many of the tasks for the project. The following subcontractors will perform the following tasks:

Tyson Holmes, Ph.D. Tyson Holmes will provide consultation in monitoring design to this project. He has developed sampling, monitoring, and experimental designs and conducted statistical analyses for restoration projects and ecological research in oak woodlands, riparian corridors, vernal pools, grasslands, wetlands, riverine aquatic-plant habitat, marshlands, and dune systems. He consults to private non-profits, private consulting firms, and universities as well as municipal, regional, State, and Federal agencies.

Davis Environmental Consulting will be responsible for securing regulatory compliance for the Delta Meadows Restoration project. Ms. Ellyn Miller Davis, principal, has in-depth experience in and knowledge of natural resources planning and regulatory compliance. Her 13 years of experience as an environmental consultant in northern California has given her a solid working knowledge of environmental resource laws and regulations including Sections 404 and 401 of the federal Clean Water Act, Section 10 of the Rivers and Harbors Act, National Environmental Policy Act, Fish and Wildlife Coordination Act, Endangered Species Act, California Environmental Quality Act, and Section 1600 et seq. of the California Fish and Game Code.

Kjeldsen, Sinnock & Neudeck, Inc. (KSN). KSN will provide survey, mapping, and planning functions. This firm is a full service civil engineering and land surveying firm specializing in the surveying, mapping, planning, design and construction of municipal, public works and water resources related projects. The firm currently serves as consultants to over thirty communities, special districts, and local public agencies in the San Joaquin County and foothill areas. The firm presently maintains a highly qualified staff of over twenty, including civil engineers, land surveyors, a landscape architect, engineering and CADD technicians, field inspectors, and additional administrative support staff.

Andrew Engilis, Jr.
B.Sc. from University of California, Davis, postgraduate studies
University of Hawaii, Manoa. As the Senior Regional Biologist for Ducks Unlimited, Inc., Andy's principal duties are to administer Ducks Unlimited's Pacific Northwest Initiative and Wetlands Hawaii Initiative. Andy serves on steering committees for the Pacific Coast Joint Venture and the Intermountain West Habitat Joint Venture (Oregon and Washington.
Andy's waterfowl background is with Pacific Flyway species and endemic island waterfowl. In addition to these primary duties, Andy is an ornithologist specializing in the natural history of the avifauna of Pacific Islands, North America, and Australasia. Andy has published 28 professional papers dealing with avian distribution, faunal surveys, and life histories in California, Hawaii, Western Great Basin, Mexico, and Papua New Guinea. Since 1990, he has conducted numerous avifaunal surveys in the California Delta, overseen the development of wetlands, developed survey protocols for waterfowl, and directed management of wetlands at the Cosumnes River Preserve. Andy has been an active birdwatcher in California since 1971. In 1993, he began work in Mexico assessing shorebird and waterfowl populations along Mexico's West Coast. He is also a Research Affiliate at the Bishop Museum, Hawaii.

A. Sidney England, Ph.D.
Ph.D. Ecology Graduate Group, University of California, Davis. Sid is the environmental coordinator for the University of California, Davis. An ornithologist and community ecologist specializing in avian communities of California, he has conducted several important avian surveys in the California deserts, the California Delta, and in Northern California chaparral communities. Specifically, Sid examined the community ecology of birds in chaparral. He developed, directed and implemented avian response to habitat restoration (Army Corps of Engineers contract) on Donlon and Venice Cut Islands (California Delta). Sid served as the technical chair for the Swainson's Hawk Recovery Group, where he helped develop the HCP for Swainson's hawk in the North Natomas region of Sacramento County. Sid has authored several important papers on Swainson's hawk, Bendire's thrasher, the community ecology of California Birds, and the ecology of desert birds. Sid has been an avid bird watcher since the early 70's. While at U.C. Davis, Sid taught ornithology and field technique courses in wildlife management and wildlife monitoring.

Michael A. Bias, Ph.D.
Michael is the regional biologist responsible for delivering Ducks Unlimited's Valley/Bay CARE Program and special projects in California's Central Valley and San Francisco Bay Area. He directs temporary and permanent agricultural and biological staff within the Valley/Bay CARE Program. Bias earned his Ph.D. from the University of California at Berkeley in Wildland Resource Science, M.S. from Humboldt State University in Wildlife Management, and B.S. from Unity College in Maine in Wildlife Science. Bias has worked extensively on threatened and endangered species habitat and population ecology in the Sierra Nevada and San Francisco Bay area.

Compliance with Standard Terms and Conditions

Applicants will comply with the standard terms as described in CALFEDS Attachments D and E. Attachment D includes standard terms for projects funded by the State. Attachment E includes standard forms for projects funded by the Federal government.

Table I - Total Budget

Task	Contract	Total
Task 1 Administration	State Parks	$50,000
Task 2 Project Management	H.A.R.T.	$40,000
Task 3 Planning/permitting	H.A.R.T. and Davis	$30,000
Task 4 Aerial Photography, GIS	H.A.R.T. and KSN	$30,000
Task 5 Native Vegetation Surveys	H.A.R.T.	$30,000
Task 6 Bird Surveys	H.A.R.T. , Engilis and England	$36,000
Task 7 Fish/invertebrate Surveys	H.A.R.T. and UC Davis	$30,000
Task 8 Mammal Surveys	H.A.R.T. and Bias	$40,000
TOTAL PHASE I		**$336,000**
Task 9 Restoration/monitoring	H.A.R.T.	$360,000
TOTAL PHASE I AND II		**$696,000**

Table II Quarterly Budget

Task	Oct - Dec 99	Jan– Mar 00	Apr-Jun 00	July-Sept 00	Oct-Dec 00	Total Budget
1		$5000	$5000	$5000	$5000	$25,000
2	$2000	$2000	$2000	$2000	$2000	$10,000
3	$30,000					$30,000
4	$30,000					$30,000
5			$10,000			$10,000
6			$9000		$9000	$18,000
7			$5000		$5000	$10,000
8			$5500		$5500	$11,000
9		$50,000			$100,000	$150,000
TOTAL						$294,000

Table III Schedule

Milestone	Consultant	Deliverables	Time
Survey/classification of sites	H.A.R.T.*, KSN, Engilis, Bias	GIS Map Written description and data sheets	Fall 1999
Planning/Permitting	Davis, H.A.R.T.	Permits secured	Fall 1999
Vegetation Survey	H.A.R.T.	Inventory List, Maps, Transects Permanent Monitoring Plot, Aerial Photography	Winter 1999, Spring 2000, Summer 2000
Bird Survey	Engilis, Sidney	Inventory List, Plots/Transects Permanent Monitoring Plots	Winter 2000, Spring 2000, Summer 2000, Fall 2000
Mammal Survey	Bias	Inventory List, Plots/Transects Permanent Monitoring Plots	Spring 2000, Fall 2000
Aquatic Invertebrates/Insects Survey	Holmes	Inventory List, Plot Permanent Monitoring Plots	Fall 2000
Fish Survey	CA Department of Fish and Game	Inventory List, Plots Permanent Monitoring Plots	Spring 2000, Fall 2000, Winter 2000
Design/restoration and monitoring plan	H.A.R.T., Holmes	Restoration and Monitoring Plan Permanent Monitoring Plots	Spring 2000
Growing of plants, material fabrication	H.A.R.T. , Inc	Number of plants propagated/materials constructed	1999 - 2002
Implementation	H.A.R.T.	Quarterly Reports of amount of habitat installed	Fall 2000, Fall 2001, Fall 2002
Monitoring	H.A.R.T.	Monitoring Reports	

I-014038

Table IV Monitoring and Data Collection Information

Biological/Ecological Objectives		
Hypothesis/Questions to be Answered	Monitoring Parameters and Data Collection Approach	Data Evaluation Approach
1. Species Inventory Lists – Vegatation	Line Transects and Aerial Photography	Phytosociological methods and GIS interpretation
2. Species Inventory – Birds	Variable Circular Plots and Line Transects	DISTANCE program
3. Species Inventory – Mammals	Grid Capture with Sherman Traps	Mark re-capture
4. Species Inventory – Aquatic Invertebrates/Insects	Samples in grid locations	Relate density and water quality
5. Species Inventory – Fish	Sample seasonally using throw nets, gillnets, snorkeling	Relative density and water quality
6. Plant species richness and plant structural diversity will be greater at the restoration sites than at the do-nothing sites	Species numbers and abundance relative to different canopy layers	Diversity indices/physical habitat model
7. Weed cover will be lower at the restoration sites than the do-nothing sites	Percent vegetative cover measured	Percent vegetative cover decreased

Table V

Summary of Anticipated Regulatory Compliance and Permitting Activities for the Delta Meadows Project

REGULATION	REGULATORY AGENCY	REQUIRED AUTHORIZATION
FEDERAL REGULATIONS		
National Environmental Policy Act (NEPA)	U.S. Army Corps of Engineers	Environmental Assessment
Clean Water Act Section 404 (33 USC 1344)	U.S. Army Corps of Engineers	Section 404 nationwide permit
Rivers and Harbors Act of 1899, Section 10 (33 CFR 329.4)	U.S. Army Corps of Engineers	Section 10 permit or letter of permission
Clean Water Act Section 401	Central Valley Regional Water Resources Control Board	Water Quality Certification or Waiver
Endangered Species Act (16USC 1531 et seq.)	U.S. Fish and Wildlife Service	Biological Opinion/No Jeopardy Opinion
National Historic Preservation Act Section 106 (16 USC 470 et seq.)	Consultation (required for Clean Water Act Section 404 Permit)	State Historic Preservation Officer
STATE REGULATIONS		
California Fish and Game Code Section 1600-1607	California Department of Fish and Game	Streambed Alteration Agreement
California Environmental Quality Act (CEQA)	California State Parks and Recreation	Environmental Document
California Code of Regulations, Title 2, Division 3, Section 1900 et seq. and Public Resources Code Section 6000 et seq.	California State Lands Commission	Land Use Lease
California Water Code Section 8590 et seq.	The Reclamation Board	Encroachment Permit
California Water Code	State Water Resources Control Board, Division of Water Rights	Water Right
California Endangered Species Act (Fish and Game Code Sec. 2081 et seq.)	2081 Permit	California Department of Fish and Game

I-014040

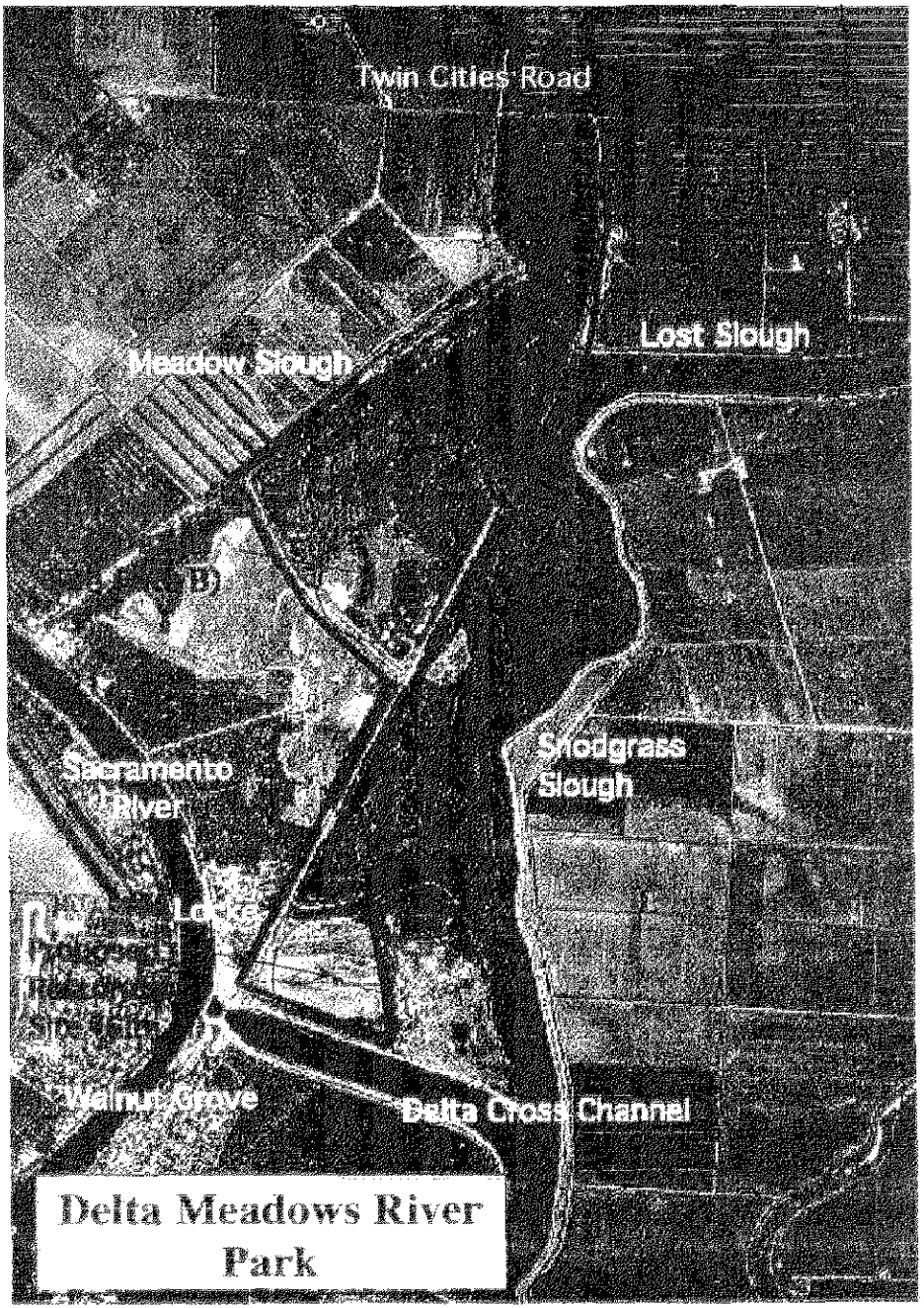
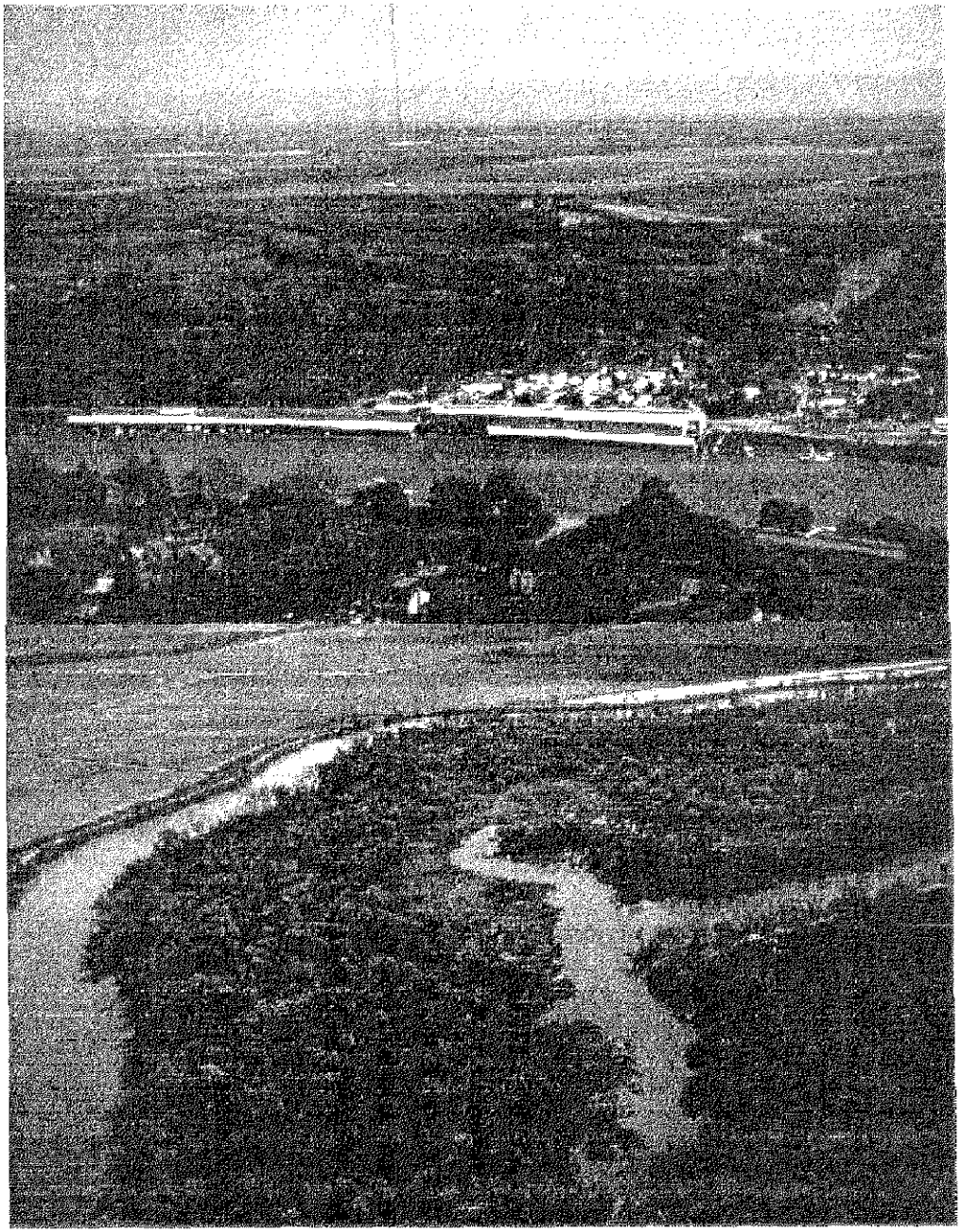
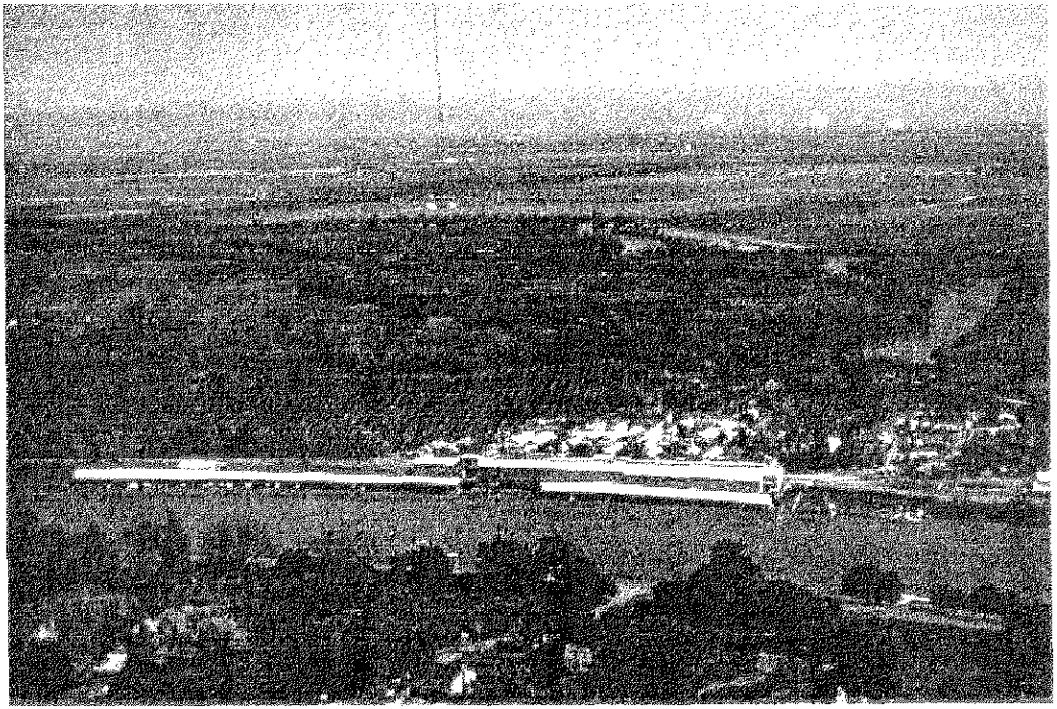
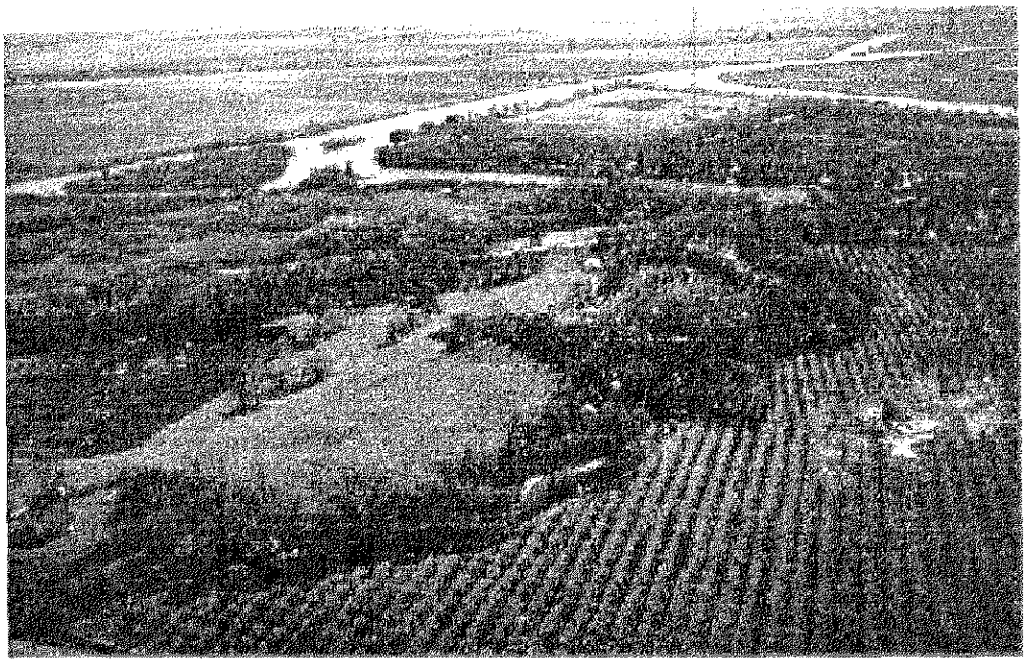

Twin Cities Road
Lost Slough
Meadow Slough
Sacramento River
Shodgrass Slough
Walnut Grove
Delta Cross Channel
Delta Meadows River Park

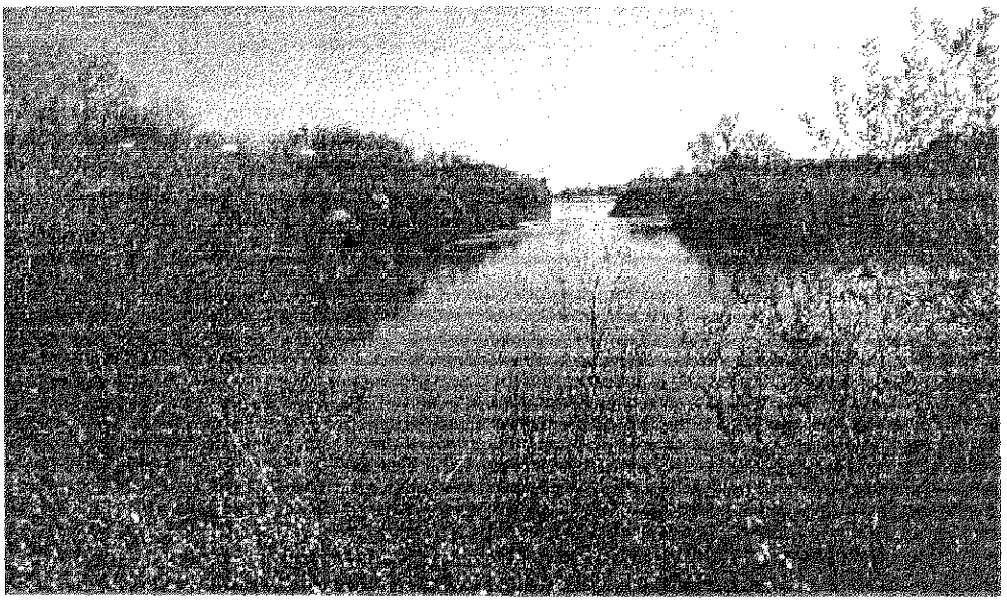
FIGURE 1

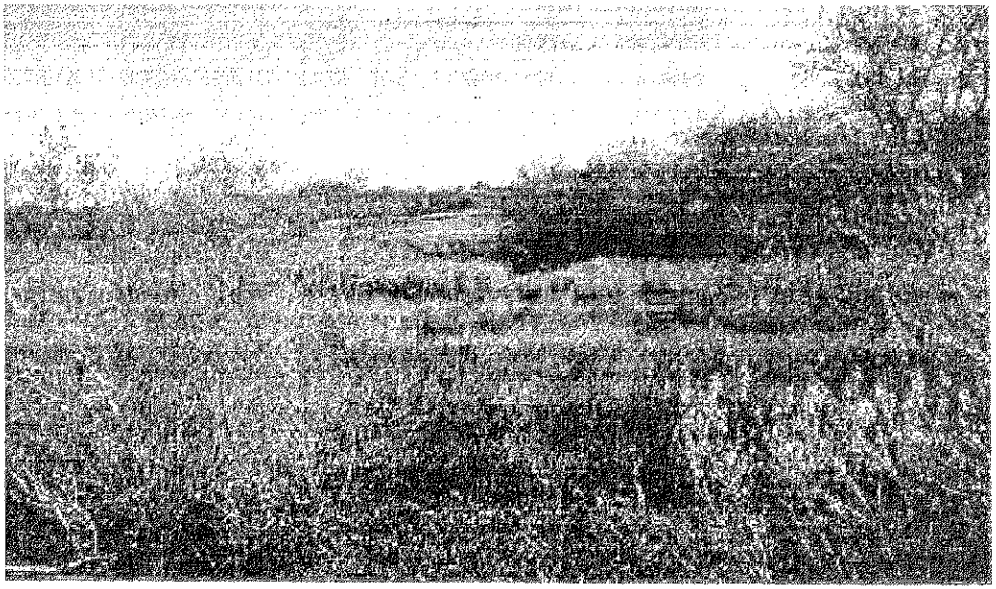


Aerial Views of the Delta Meadows State Park









U.S. Department of the Interior

Certifications Regarding Debarment, Suspension and Other Responsibility Matters, Drug-Free Workplace Requirements and Lobbying

Persons signing this form should refer to the regulations referenced below for complete instructions:

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions - The prospective primary participant further agrees by submitting this proposal that it will include the clause titled, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions. See below for language to be used; use this form for certification and sign; or use Department of the Interior Form 1954 (DI-1954). (See Appendix A of Subpart D of 43 CFR Part 12.)

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions - (See Appendix B of Subpart D of 43 CFR Part 12.)

Certification Regarding Drug-Free Workplace Requirements - Alternate I. (Grantees Other Than Individuals) and Alternate II. (Grantees Who are Individuals) - (See Appendix C of Subpart D of 43 CFR Part 12)

Signature on this form provides for compliance with certification requirements under 43 CFR Parts 12 and 18. The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of the Interior determines to award the covered transaction, grant, cooperative agreement or loan.

PART A: Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions

CHECK__IF THIS CERTIFICATION IS FOR A PRIMARY COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

PART B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions

CHECK__IF THIS CERTIFICATION IS FOR A LOWER TIER COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

PART C: Certification Regarding Drug-Free Workplace Requirements

CHECK__IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS NOT AN INDIVIDUAL

Alternate I. (Grantees Other Than Individuals)

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an ongoing drug-free awareness program to inform employees about–
(1) The dangers of drug abuse in the workplace;
(2) The grantee's policy of maintaining a drug-free workplace;
(3) Any available drug counseling, rehabilitation, and employee assistance programs; and
(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will –
(1) Abide by the terms of the statement; and
(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(e) Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification numbers(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted –
(1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a) (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

_____

_____

_____

Check___if there are workplaces on file that are not identified here.

PART D: Certification Regarding Drug-Free Workplace Requirements

CHECK__IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS AN INDIVIDUAL

Alternate II. (Grantees Who Are Individuals)

(a) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;

(b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

PART E: Certification Regarding Lobbying
Certification for Contracts, Grants, Loans, and Cooperative Agreements

CHECK IF CERTIFICATION IS FOR THE AWARD OF ANY OF THE FOLLOWING AND THE AMOUNT EXCEEDS $100,000: A FEDERAL GRANT OR COOPERATIVE AGREEMENT; SUBCONTRACT, OR SUBGRANT UNDER THE GRANT OR COOPERATIVE AGREEMENT.

CHECK IF CERTIFICATION IS FOR THE AWARD OF A FEDERAL LOAN EXCEEDING THE AMOUNT OF $150,000, OR A SUBGRANT OR SUBCONTRACT EXCEEDING $100,000, UNDER THE LOAN.

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL S. Macy

TYPED NAME AND TITLE S. Macy / Park Superintendent

DATE 4/12/99

STATE OF CALIFORNIA—RESOURCE AGENCY GRAY DAVIS, Governor

DEPARTMENT OF PARKS AND RECREATION
BRANNAN ISLAND STATE RECREATION AREA
17845 STATE HIGHWAY 160
RIO VISTA, CA 94571
(916)777-7701

April 8, 1999

Sacramento County Board of Supervisors
700 H Street
Sacramento, California

Honorable Supervisors:

The Delta Sector of the California Department of Parks and Recreation is seeking grant funding for two projects within Sacramento County.

The vegetation restoration and habitat improvement project will involve state owned property in the vicinity of Locke. The project will restore habitat destroyed by overgrazing and public misuse. It will also provide for visitor fishing access, hiking trails and interpretive/educational displays.

The Delta Information Center would be located at Brannan Island State Recreation Area. This project would provide information on the natural and cultural history of the Delta, resource conservation and safety and recreational opportunities in the Delta. It would also provide information on the various agencies and businesses involved in resource management and recreation in the Delta.

Both projects would generate additional visitors to the area and increase visitors' knowledge of the natural, cultural and recreational resources of the Delta.

If funding is approved, we will be seeking input from both private and public agencies, including Sacramento County. We hope you will support our efforts.

Sincerely,

Stu Macy
Superintendent
Delta Sector

STATE OF CALIFORNIA—RESOURCE AGENCY GRAY DAVIS, Governor

DEPARTMENT OF PARKS AND RECREATION
BRANNAN ISLAND STATE RECREATION AREA
17645 STATE HIGHWAY 160
RIO VISTA, CA 94571
(916)777-7701

April 8, 1999

Margit Aramburu
Delta Protection Commission
P.O. Box 530
Walnut Grove, California 95690

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Delta Sector